

## **AMENDMENTS TO THE CLAIMS**

Please amend the claims as follows:

The following claim listing replaces prior versions and listings of claims in the application:

1. (original)           An apparatus for thermocycling comprising  
                          a small volume reaction vessel;  
                          a remote temperature sensor for monitoring the temperature of a fluid sample inside the  
reaction vessel; and  
                          a microprocessor operatively associated with the temperature sensor.
2. (original)           The apparatus of claim 1, wherein the remote temperature sensor is an  
optical interferometric sensor.
3. (original)           The apparatus of claim 2, further comprising a heating means for heating  
the reaction vessel and a cooling means for cooling the reaction vessel, both the heating means  
and cooling means are operatively associated with the microprocessor.
4. (original)           The apparatus of claim 3, wherein the heating means is an IR source.
5. (original)           The apparatus of claim 4, wherein the IR source is selected from the group  
consisting of a halogen lamp and a tungsten lamp.

6. (original)            The apparatus of claim 4, wherein the IR source is disposed in a spaced relationship with respect to the reaction vessel.
7. (original)            The apparatus of claim 3, wherein the cooling means is a compressed air source.
8. (original)            The apparatus of claim 7, wherein the compressed air source has means for chilling air.
9. (original)            The apparatus of claim 2, wherein the reaction vessel is selected from the group consisting of a capillary tube, a microchip, a microchamber, and a microtiter plate.
10. (original)    The apparatus of claim 2, wherein the microprocessor comprises means for effecting DNA amplification in a sample.
11. (original)    The apparatus of claim 2, wherein the microprocessor comprises means for converting the frequency output of the EFPI to temperature.
12. (original)    The apparatus of claim 2, wherein the small volume vessel holds about 0.4  $\mu\text{L}$  to about 100  $\mu\text{L}$  of the fluid sample.
13. (original)    The apparatus of claim 2, wherein the optical interferometric sensor is an extrinsic Fabry-Perot interferometer (EFPI).

14. (original) A temperature sensor for sensing the temperature of a small volume solution comprising

an optical interferometric sensor; and

a support system associated with the optical interferometric sensor for displaying the output of the optical interferometric sensor.

15. (original) The temperature sensor of claim 14, wherein the small volume solution is from about 100 pL to about 100  $\mu$ L.

16. (original) The temperature sensor of claim 14, further comprising a microprocessor for receiving signals from the support system and converting the signals into a temperature of the small volume solution.

17. (original) The temperature sensor of claim 14, wherein the support system is a spectrophotometer.

18. (original) The temperature sensor of claim 14, wherein the optical interferometric sensor is an extrinsic Fabry-Perot interferometer (EFPI).

19. (previously presented) A method for measuring the temperature of a small volume solution comprising the steps of:

providing an optical interferometric sensor;

providing a small volume of a sample contained in a closed reservoir;  
interrogating the small volume with the optical interferometric sensor to obtain an output;  
and  
converting the output of the optical interferometric sensor to temperature using a standard curve.

20. (original) The method of claim 19, wherein the small volume of a sample is contained in a capillary tube, a microchip, a microchamber, or a microtiter plate.

21. (previously presented) The method of claim 19, wherein the standard curve is obtained by interrogating samples with known temperatures using the optical interferometric sensor.

22. (original) The method of claim 19, wherein the converting step is accomplished by a microprocessor.

23. (original) The method of claim 19, wherein the small volume is about 0.4  $\mu\text{L}$  to about 100  $\mu\text{L}$ .

24. (original) The method of claim 19, wherein the optical interferometric sensor is an extrinsic Fabry-Perot interferometer (EFPI).

25. (new) The method of claim 19, wherein the sample is a DNA or protein solution.